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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,882	10/30/2003	Stefan Bader	5367-47	9126

7590 03/27/2006

COHEN, PONTANI, LIEBERMAN & PAVANE  
Suite 1210  
551 Fifth Avenue  
New York, NY 10176

EXAMINER
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RAO, G NAGESH

ART UNIT	PAPER NUMBER
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1722

DATE MAILED: 03/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

CMA

<b>Office Action Summary</b>	<b>Application No.</b> 10/696,882	<b>Applicant(s)</b> BADER ET AL.	
	<b>Examiner</b> G. Nagesh Rao	<b>Art Unit</b> 1722	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.  |

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

- 1) Claims 1-6 and 11-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Ohba (US Patent No. 6,242,764).

Ohba 764 pertains to a method for fabricating a III-N semiconductor light emitting element having strain moderating crystalline buffer layers. According to Ohba 764's specification the object of the invention shows a variety of ways of depositing an AlGaInN layer ontop of a SiC substrate while having a thermal absorption layer underneath the SiC substrate for exhibiting a good absorption of thermal radiation (See Col 2 Lines 15-68, Col 9 Lines 15-43 (5<sup>th</sup> Embodiment) and Figure 6). Examiner points out to figure 6 which clearly shows a SiC substrate (501) with a Al/Ti n-side electrode (522) reason being that an electrically conductive material is used for forming the substrate and an electrode is mounted to a back surface of the conductive substrate, with the result that the p-side electrode can be

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brought into contact with a heat dissipitator, suggesting that the underlying layer 522 is acting as a thermal absorption layer means.

Finally the layers of AlGaInN or variations of the like are deposited via an MOCVD apparatus although described in the 6<sup>th</sup> embodiment it is explicitly stated to be also utilized in the 5<sup>th</sup> embodiment (See Col 9 Lines 45-59) whereby the SiC substrate is put on a susceptor which also acts as a heater thus capable of heating the substrate to the deposition temperature (See Col 9 Lines 60-68 and Col 10 Lines 1-29).

Although applicant states their method is performed via MOVPE, MOCVD is understood in the art to be an alternative term for MOVPE. In anticipation of applicant's objection, examiner submits evidence of such claim from the textbook "Electronic Materials Science For Integrated Circuits in Si and GaAs by James Mayer and S.S. Lau, as well a proper cited definition by Wikipedia.

It would be understood that if the heating capabilities of the MOCVD apparatus utilized in Ohba 764 would essentially effect the method step (c) claimed by applicant by means of thermal radiation and would inherently be used to generate thermal radiation from the heating source having a spectral range for which the thermal radiation absorption layer exhibits good radiation absorption.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

2) Claims 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohba (US Patent No. 6,242,764) in view of Hirano (US Patent No. 5,771,110).

From the aforementioned Ohba 764 pertains to a method for fabricating a III-N semiconductor light emitting element having strain moderating crystalline buffer layers that reads on parts of applicant's claimed invention.

However Ohba 764 fails to explicitly teach sputtering as a technique for depositing a thermal radiation absorption layer.

In a method pertaining to thin film structure device techniques Hirano 110 teaches that it is known to use a sputtering technique for deposition of a thermal absorption layer film (See Col 15 Lines 19-40 and Col 16 Lines 30-65).

It would be obvious at the time of the invention to one with ordinary skill in the art to modify the teachings of Ohba 764 with Hirano 110 by employing a sputtering technique because the higher rate of deposition results in lower impurity incorporation because fewer impurities are able to reach the surface of the substrate in the same amount of time. Sputtering methods are consequently able to use process gases with far higher impurity concentrations than the vacuum pressure that MBE methods can tolerate. During sputter deposition the substrate may be bombarded by energetic ions and neutral atoms. Ions can be deflected with a substrate bias and neutral bombardment can be minimized by **off-axis sputtering**, but only at a cost in deposition rate.

Furthermore Hirano 110 teaches the advantages of using an amorphous based silicon layer preferably doped as a type of thermal

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absorption layer, albeit it teaches a variety of doping ranges and thickness ranges for the thermal absorption layer it does not indicate any specified reasons as to why those dimensions are desired. Examiner notes that applicant too has denoted thickness and doping values, but in the specification there is no apparent reason or significant explanation teaching why those traits are desired.

Therefore it would be obvious at the time of the invention to one with ordinary skill in the art to modify the teachings of Ohba 764 to utilize a thermal absorption layer such as a doped silicon layer from the teachings of Hirano 110 underneath a SiC substrate to be able to have lattice coordination and avoid lattice mis matchings with two silicon based materials rather than a silicon and non-silicon based material, and as well derive the same benefit of a thermal absorption layer as desired by Ohba 764.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to G. Nagesh Rao whose telephone number is (571) 272-2946. The examiner can normally be reached on 9AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on (571) 272-1166. The

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fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

GNR

DUANE SMITH  
PRIM. EXAMINER  
*D*  
3-20-06